What is claimed is:

1. A method for use in a wireless network, comprising:

identifying a plurality of orthogonal sets of user devices, wherein each orthogonal set in said plurality of orthogonal sets includes multiple user devices that can be transmitted to concurrently by an access point using different antenna beams;

selecting an orthogonal set from the plurality of orthogonal sets based on a predetermined selection criterion; and

initiating a spatial division multiple access (SDMA) exchange for the selected orthogonal set.

2. The method of claim 1, wherein:

selecting an orthogonal set includes selecting a set based on an amount of data that is buffered for delivery to user devices within each of said identified orthogonal sets.

3. The method of claim 1, wherein:

selecting an orthogonal set includes:

determining a maximum duration for the SDMA exchange;

evaluating orthogonal sets in said plurality of orthogonal sets to determine an amount of data that is buffered for said orthogonal sets; and

selecting an orthogonal set that has a largest amount of buffered data that can be delivered within said maximum duration of said SDMA exchange.

4. The method of claim 1, wherein:

selecting an orthogonal set includes using quality of service (QOS) information as part of said predetermined selection criterion.

5. The method of claim 1, wherein:

selecting an orthogonal set includes using latency related information as part of said predetermined selection criterion.

6. The method of claim 1, wherein:

initiating an SDMA exchange includes simultaneously transmitting data to user devices in said selected orthogonal set, using corresponding antenna beams, so that a terminal end of the data transmitted to each user device occurs at substantially the same time.

7. The method of claim 6, further comprising:

receiving acknowledgement (ACK) signals from said user devices in said selected orthogonal set after said data has been transmitted, wherein said ACK signals are received from said user devices at approximately the same time.

8. The method of claim 1, wherein initiating an SDMA exchange includes:

simultaneously transmitting data to user devices in said selected orthogonal set using corresponding antenna beams; and

transmitting an acknowledgement (ACK) request to each user device in said selected orthogonal set after said data has been transmitted.

9. The method of claim 8, wherein:

transmitting an ACK request includes transmitting a separate ACK request to each user device in said selected orthogonal set using a corresponding antenna beam.

10. The method of claim 9, wherein:

said separate ACK requests are transmitted to corresponding user devices at substantially the same time.

11. The method of claim 10, wherein:

said separate ACK requests each include time information indicative of a time at which a corresponding user device is to respond to said ACK request.

12. The method of claim 9, wherein:

said separate ACK requests are transmitted to corresponding user devices at different times, wherein said different times are selected based upon a predicted resolvability of signals received from said user devices within said selected orthogonal set.

13. The method of claim 8, wherein:

transmitting an ACK request includes transmitting a single multi-user ACK request using an antenna beam that encompasses all of said user devices in said selected orthogonal set.

14. The method of claim 13, wherein:

said single multi-user ACK request includes time information indicative of a time at which each user device in said selected orthogonal set is to respond to said single multi-user ACK request.

15. The method of claim 14, wherein:

said time information is determined based upon a predicted resolvability of signals received from said user devices within said selected orthogonal set.

16. The method of claim 1, wherein:

initiating an SDMA exchange includes transmitting data to user devices in said selected orthogonal set using corresponding antenna beams, wherein said data transmitted to each of said user devices includes time information indicating a time at which the corresponding user device is to acknowledge the data.

17. The method of claim 1, wherein:

initiating an SDMA exchange includes transmitting a training request packet to a first user device within the selected orthogonal set.

18. The method of claim 17, wherein:

said training request packet is transmitted using an antenna beam that encompasses substantially an entire coverage region of the access point.

19. The method of claim 1, wherein:

initiating an SDMA exchange includes transmitting a multi-user training request packet to all of the user devices within said selected orthogonal set, wherein said multi-user training request packet is transmitted using an antenna beam that encompasses substantially an entire coverage region of the access point.

20. An access point (AP) for use in a wireless network implementing spatial division multiple access (SDMA), comprising:

a multi-user wireless transceiver that is capable of simultaneously servicing multiple users within a coverage area of the AP; and

a controller, coupled to said multi-user wireless transceiver, to identify a number of orthogonal sets of user devices within the coverage area, to select one of the identified orthogonal sets, and to initiate an SDMA exchange for the selected orthogonal set, wherein an orthogonal set is a set that includes multiple user devices that can be transmitted to concurrently by the access point using different antenna beams.

21. The AP of claim 20, further comprising:

an antenna controller, coupled to the multi-user wireless transceiver, to manage the generation of antenna beams for the AP.

22. The AP of claim 20, wherein:

said controller selects one of the identified orthogonal sets based on an amount of data that is buffered for delivery to user devices in each of the identified orthogonal sets.

23. The AP of claim 20, wherein:

said controller selects one of the identified orthogonal sets based, at least in part, on a maximum duration of a subsequent SDMA exchange.

24. The AP of claim 20, wherein:

said controller initiates said SDMA exchange by causing said multi-user wireless transceiver to transmit data to each of the user devices in said selected orthogonal set using a separate antenna beam for each user device.

25. The AP of claim 24, wherein:

said controller causes said data to be transmitted by said multi-user wireless transceiver so that a terminal end of the data transmitted to each of the user devices in said selected orthogonal set occurs at substantially the same time.

26. The AP of claim 24, wherein:

said controller causes said multi-user wireless transceiver to transmit an acknowledgement request to each of the user devices in said selected orthogonal set, using a separate antenna beam for each user device, after said data has been transmitted.

27. The AP of claim 26, wherein:

said controller causes said multi-user wireless transceiver to transmit an acknowledgement request to each of the user devices in said selected orthogonal set at substantially the same time.

28. The AP of claim 26, wherein:

said controller causes said multi-user wireless transceiver to transmit an acknowledgement request to each of the user devices in said selected orthogonal set at different times, wherein said different times are based upon a predicted resolvability of the resulting acknowledgement signals.

29. The AP of claim 24, wherein:

said controller causes said multi-user wireless transceiver to transmit a single acknowledgement request to the user devices in said selected orthogonal set, using an antenna beam that encompasses all of the user devices in said selected orthogonal set, after said data has been transmitted.

30. The AP of claim 29, wherein:

said single acknowledgement request includes timing information indicating a time at which an acknowledgement signal is to be transmitted by each of the user devices within said selected orthogonal set.

31. The AP of claim 24, wherein:

said data transmitted to each of the user devices in said selected orthogonal set includes timing information indicating a time at which an acknowledgement signal is to be transmitted by each of the user devices in said selected orthogonal set.

32. An article comprising a storage medium having instructions stored thereon that, when executed by a computing platform, result in:

identifying a plurality of orthogonal sets of user devices, wherein each orthogonal set in said plurality of orthogonal sets includes multiple user devices that can be transmitted to concurrently by an access point using different antenna beams;

selecting an orthogonal set from the plurality of orthogonal sets based on a predetermined selection criterion; and

initiating a spatial division multiple access (SDMA) exchange for the selected orthogonal set.

33. The article of claim 32, wherein:

selecting an orthogonal set includes selecting a set based on an amount of data that is buffered for delivery to user devices within each of said identified orthogonal sets.

34. The article of claim 32, wherein:

initiating an SDMA exchange includes simultaneously transmitting data to user devices in said selected orthogonal set, using corresponding antenna beams, so that a terminal end of the data transmitted to each user device occurs at substantially the same time.

35. The article of claim 32, wherein initiating an SDMA exchange includes:

simultaneously transmitting data to user devices in said selected orthogonal set using corresponding antenna beams; and

transmitting an acknowledgement (ACK) request to each user device in said selected orthogonal set after said data has been transmitted.

36. The article of claim 35, wherein:

transmitting an ACK request includes transmitting a separate ACK request to each user device in said selected orthogonal set using a corresponding antenna beam.

37. The article of claim 35, wherein:

transmitting an ACK request includes transmitting a single multi-user ACK request using an antenna beam that encompasses all of said user devices in said selected orthogonal set.

38. The article of claim 32, wherein:

initiating an SDMA exchange includes transmitting data to user devices in said selected orthogonal set using corresponding antenna beams, wherein said data

transmitted to each of said user devices includes time information indicating a time at which the corresponding user device is to acknowledge the data.

39. A system comprising:

a plurality of antenna elements that includes at least one dipole antenna element;

a multi-user wireless transceiver, in communication with said plurality of antenna elements, that is capable of simultaneously servicing multiple users within a network coverage area; and

a controller, coupled to said multi-user wireless transceiver, to identify a number of orthogonal sets of user devices within the network coverage area, to select one of the identified orthogonal sets, and to initiate an SDMA exchange for the selected orthogonal set, wherein an orthogonal set is a set that includes multiple user devices that can be transmitted to concurrently using different antenna beams.

40. The system of claim 39, further comprising:

an antenna controller, coupled to the multi-user wireless transceiver, to manage the generation of antenna beams using the plurality of antenna elements.

41. The system of claim 39, wherein:

said controller initiates said SDMA exchange by causing said multi-user wireless transceiver to transmit data to each of the user devices in said selected orthogonal set using a separate antenna beam for each user device.

42. The system of claim 41, wherein:

said controller causes said data to be transmitted by said multi-user wireless transceiver so that a terminal end of the data transmitted to each of the user devices in said selected orthogonal set occurs at substantially the same time.

43. The system of claim 41, wherein:

said controller causes said multi-user wireless transceiver to transmit an acknowledgement request to each of the user devices in said selected orthogonal set, using a separate antenna beam for each user device, after said data has been transmitted.

44. A method for use in a wireless network, comprising:

determining an amount of data to be transmitted to each user device in a group of user devices;

determining when data transmission needs to be started for each user device in said group of user devices so that data transmission to all of the user devices in said group of user devices terminates at substantially the same time; and

transmitting data to the user devices in said group of user devices at the appropriate times so that data transmission to all of the multiple user devices terminates at substantially the same time, wherein data is transmitted to each of the user devices in said group of user devices using a different antenna beam.

45. The method of claim 44, further comprising:

receiving acknowledgement signals from said user devices in said group of user devices in response to said transmitted data, wherein said acknowledgement signals are all received at approximately the same time.

46. The method of claim 45, wherein:

said acknowledgement signals are each received in a different receive beam.